

## ABSTRACT

A QPSK modulation scheme uses a data spreading mechanism to rob a relatively limited portion of available transmitter power, and inject into the QPSK waveform a prescribed amount of carrier signal power, through which detection and non-regenerative extraction of the carrier at the receiver may be achieved without incurring a signal-to-noise degradation penalty. In addition, the injected carrier-based modulation scheme of the invention may employ high performance forward error correction coding, to significantly reduce the signal power required for achieving a very low energy per bit-to-noise density ratio ( $E_b/N_0$ ) - on the order of one to zero dB.